

Trader

SERVICE SHEET

(Also covering Astrad "VEGA" 302)

A battery-operated portable receiver, the Astrad "Riga" R302 covers long and medium wave broadcast bands on AM, and the VHF/FM broadcast band. AM reception is from a built-in ferrite aerial, and FM from a telescopic aerial. Edgewise controls are fitted for tuning and volume control, with slide switches for waveband selection and tone control. Sockets are provided for AM external aerial and earth connection, and for a personal earphone.

Housed in a three-tone plastics cabinet with silver trim, the Riga R302 is supplied complete with leather carrying case and strap.

Brief Specification

Power supply	6 HP7 (or equivalent) 1.5V batteries (9V d.c.)		
Wavebands	AM: LW 735.3 to 2000m (150 to 408kHz) MW 186.9 to 571.4m (525 to 1605kHz) FM: VHF 87.5 to 108MHz		
Intermediate frequencies	AM: 465 kHz FM: 10.7MHz		
Transistors	T322A (five) MPT108B, PR108G, MN41, (two) (USSR types)		
Diodes	902*, 9B*, 20* (two)		
AF output	150mW		
Inputs	External aerial and earth		
Output	Earphone		
Loudspeaker	2½in (64mm) round, impedance 10 ohms		
Dimensions	<i>Height</i>	<i>Width</i>	<i>Depth</i>
	3½in	8½in	1½in
	(96mm)	(222mm)	(47mm)
Manufacturer	V/O Radiozagrannostavka, Riga, USSR.		
U.K. Distribution and Service	Technical and Optical Equipment Ltd., Zenith House, Thane Villas, London N7 01-263 0951		
	* USSR-type prefixes		

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Dismantling

(see internal view diagrams)

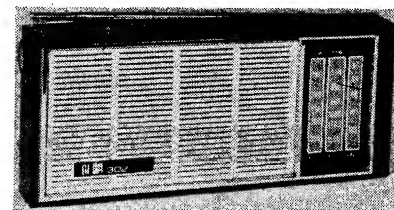
1. Remove battery compartment cover and batteries.

2. Release two screws A from back cover—one plated, one recessed and plugged.

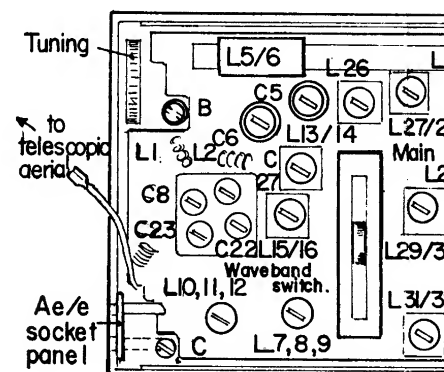
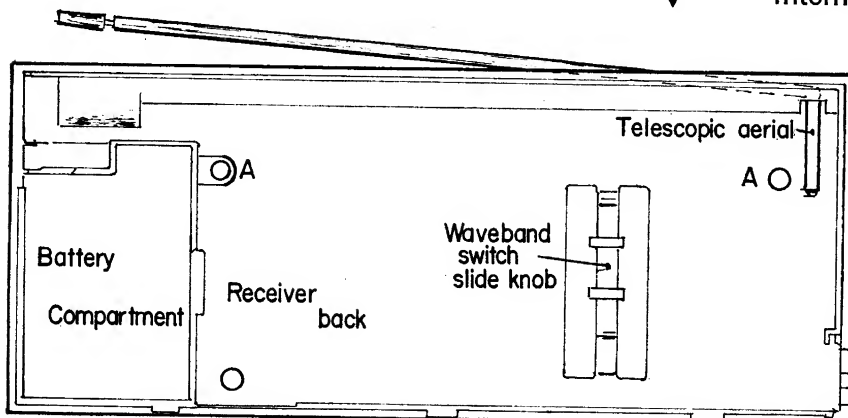
3. Remove back cover, and free back from cabinet by disconnecting flying lead from telescopic aerial, unscrewing earphone socket, removing aerial/earth socket panel.

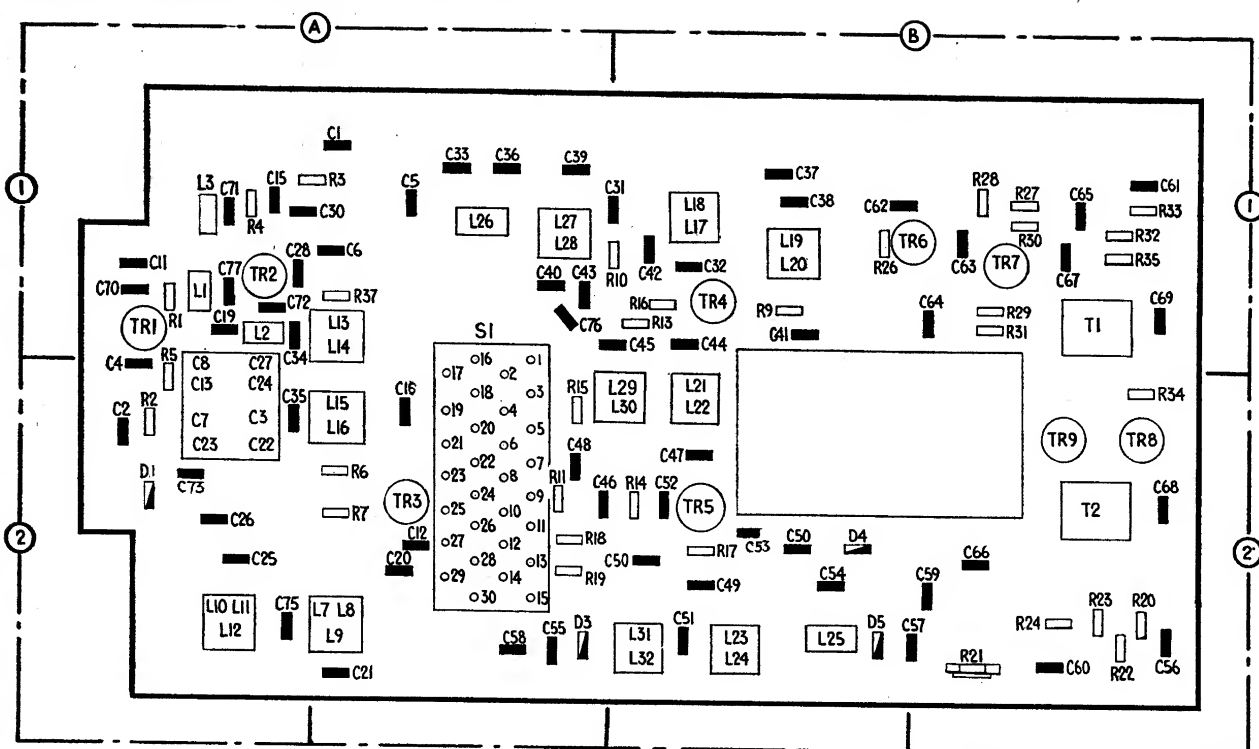
4. To remove chassis assembly—lift out tone control switch, release two threaded pillars B (one long, one short), and screw C. To free chassis from cabinet, remove volume control (after detaching control knob), and disconnect loudspeaker leads.

5. When re-assembling, be sure to engage slider switch knob on cabinet back with waveband switch toggle on chassis, and check that waveband switch operates correctly before securing cabinet back. Replug recessed back screw.



Internal view diagrams





Alignment

Equipment required:

AM signal generator covering 150 to 1610kHz, 10-7MHz, modulation 10kHz at 30 per cent.

FM signal generator covering 10-7MHz, 86 to 110MHz, deviation 22-5kHz.

Output meter (VTVM) and centre-zero voltmeter.

Suitable input matching components as detailed.

I.F. Stages

AM

1. Select "MW". Inject signals from AM generator via 0.05uF capacitor to **Tr3** base. Connect VTVM across loudspeaker terminals.
2. Tune signal generator to 465kHz. Adjust AM IFT's **L26**, **L27**, **L29**, **L31** for maximum.
3. When aligned, receiver sensitivity should be such that an input of 10uV should produce an a.f. output of 50mW.

FM

1. Select "VHF". Inject signals from AM generator via 0.01uF capacitor to **Tr5** emitter. Connect VTVM across **C60**.
2. Tune generator to 10-7MHz (unmodulated) and adjust FM IFT's **L23** for maximum, **L25** for minimum. Adjust preset **R21** for zero reading on VTVM.
3. Connect centre-zero meter across **R25**, switch on modulation at 30 per cent, and adjust **L24** for minimum.
4. Disconnect AM generator and feed signals from FM generator, tuned to 10-7MHz and deviated 22-5kHz, via 0.01uF capacitor to **Tr3** emitter. Adjust **L19**, **L17** for maximum.
5. Transfer signal generator output to **Tr2** emitter, adjust **L15**, **L13** for maximum.
6. When aligned, bandwidth should be 140 to 220kHz at 6dB. Selectivity should be 6dB down with input r.f. signal oftuned by ± 300 kHz.

R.F. Stages

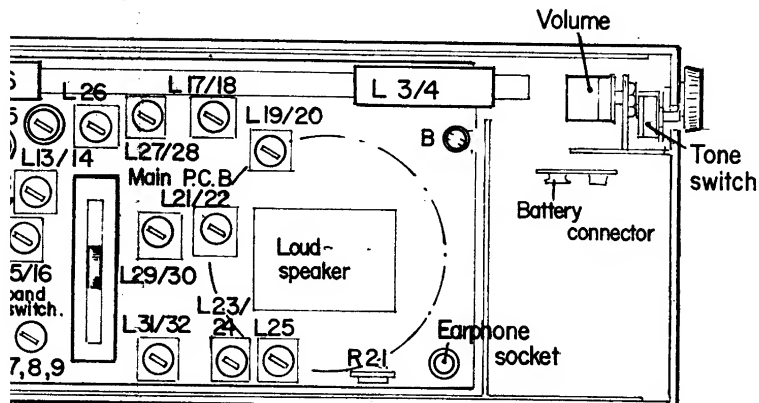
AM

Inject signals from AM signal generator via inductive loop to ferrite aerial. Connect VTVM across loudspeaker terminals. LW

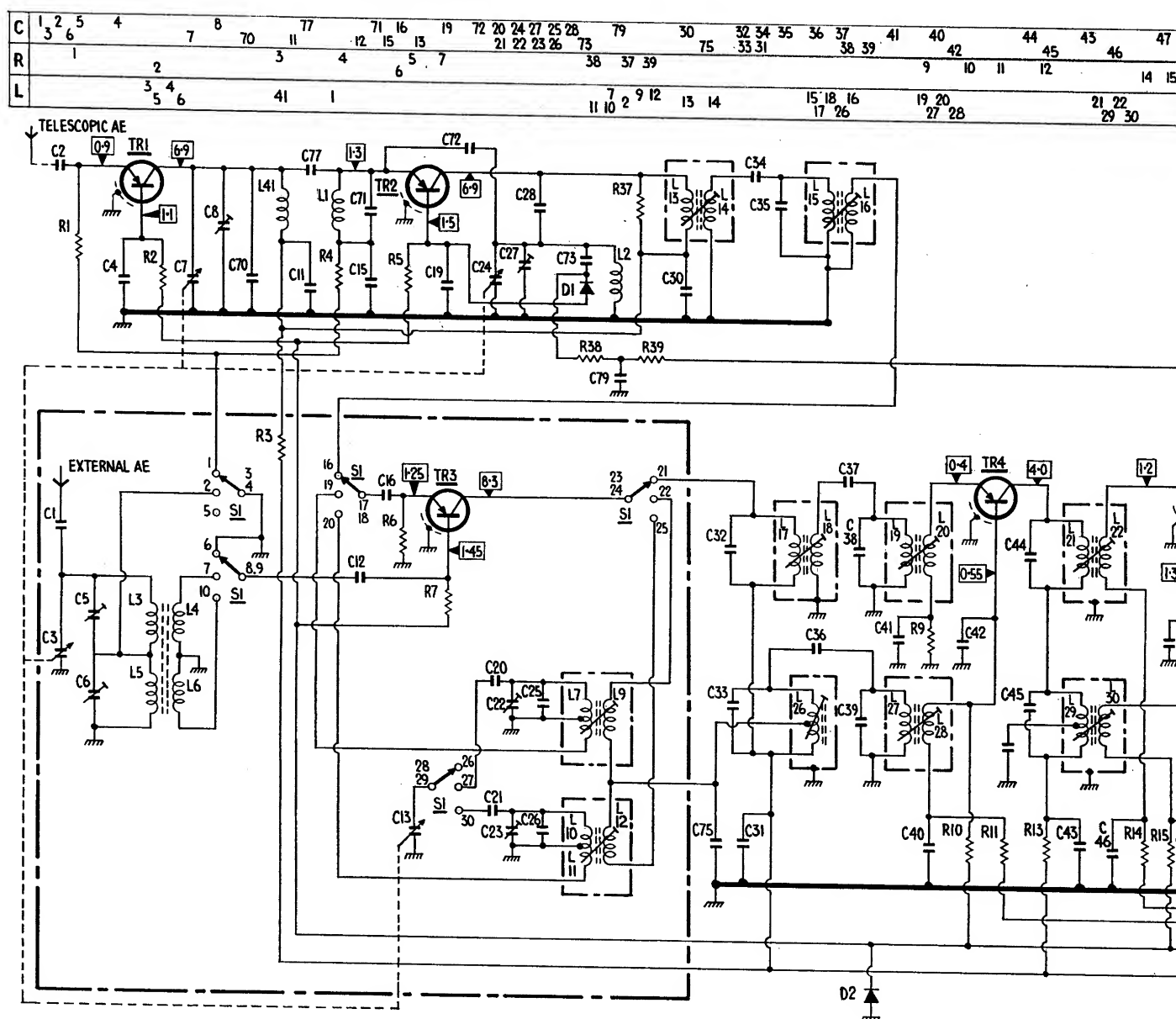
1. Select "LW". Tune receiver to low frequency end of scale, signal generator to 145kHz. Adjust oscillator coil **L10** for maximum.
2. Retune receiver to high frequency end of scale, signal generator to 465kHz. Adjust oscillator trimmer **C23** for maximum.
3. Tune receiver and signal generator to 150kHz. Adjust r.f. coil **L5** (by sliding coil along ferrite rod) for maximum.
4. Retune receiver and signal generator to 390kHz; adjust r.f. trimmer **C6** for maximum.
5. Repeat steps 2 to 6 for optimum results. Seal **L5**.

MW

1. Select "MW".
2. Tune receiver to low frequency end of scale, signal generator to 515kHz. Adjust oscillator coil **L7** for maximum.
3. Retune receiver to high frequency end of scale, signal generator to 1670kHz. Adjust oscillator trimmer **C22** for maximum.
4. Tune receiver and signal generator to 540kHz; adjust r.f. coil **L3** (by sliding coil along ferrite rod) for maximum.
5. Retune receiver and generator to 1500kHz. Adjust r.f. trimmer **C5** for maximum.
6. Repeat steps 2 to 5 for optimum results.



(continued overleaf)

**Alignment (continued)****FM**

Inject signals from FM signal generator via 0.01μF capacitor to telescopic aerial lead.

1. Select "FM".
2. Tune receiver to low frequency end of scale, signal generator to 86.5MHz. Adjust oscillator coil **L2** (by compressing or stretching turns) for maximum.
3. Retune receiver to low frequency end of scale, signal generator to 110MHz. Adjust oscillator trimmer **C27** for maximum.
4. Tune receiver and generator to 88MHz. Adjust r.f. coil **L1** for maximum.
5. Retune receiver and generator to 108MHz. Adjust r.f. trimmer **C8** for maximum.
6. Repeat steps 2 to 5 for optimum results.

Resistors

R1	2kΩ	A1
R2	15kΩ	A2
R3	1kΩ	A1
R4	2.4kΩ	A1
R5	3.6kΩ	A2
R6	18kΩ	A2
R7	5.1kΩ	A2
R9	1kΩ	B1
R10	18kΩ	B1
R11	8.2kΩ	A2
R13	5.6kΩ	B1
R14	1kΩ	B2
R15	5.1kΩ	A2
R16	5.1kΩ	B1
R17	1kΩ	B2
R18	470Ω	A2
R19	3.6kΩ	A2
R20	1kΩ	B2
R21	3.9kΩ*	B2
R22	6.8kΩ	B2
R23	6.8kΩ	B2
R24	2kΩ	B2
R25	10kΩ*	†

R26	5.1kΩ	B1
R27	27kΩ	B1
R28	56Ω	B1
R29	8.2kΩ	B1
R30	82Ω	B1
R31	120Ω	B1
R32	390Ω	B1
R33	75Ω	B1
R34	8Ω	B2
R35	470Ω	B1
R37	10kΩ	A1
R38	470Ω	not
R39	24kΩ	shn

*variable

Components**Capacitors**

C1	4.7pF	A1	C30
C2	22pF	A2	C31
C3	5—270pF	A2	C32
C4	1000pF	A2	C33
C5	3—20pF	A1	C34
C6	3—20pF	A1	C35
C7	4—25pF	A2	C36
C8	2—10pF	A2	C37
C11	0.01μF	A1	C38
C12	0.01μF	A2	C39
C13	5—270pF	A2	C40
C15	560pF	A1	C41
C16	0.0033μF	A2	C42
C19	1000pF	A1	C43
C20	300pF	A2	C44
C21	130pF	A2	C45
C22	2—10pF	A2	C46
C23	2—10pF	A2	C47
C24	4—25pF	A2	C48
C25	15pF	A2	C49
C26	37pF	A2	C50
C27	2—10pF	A2	C51
C28	56pF	A1	C52

The schematic diagram illustrates a transistor radio receiver circuit. It begins with an antenna input coupled to a tuned circuit consisting of coils L1 and L2, and capacitors C43, C46, and C48. This is followed by a first IF amplifier stage using transistor TR5, with feedback capacitor C49 and coupling capacitor C47. The signal then passes through a second IF amplifier stage with transistor TR6, which includes a variable capacitor C51 and a volume control potentiometer R28. A tone control section follows, featuring transistor TR7, a tone switch S2, and a network of resistors R29, R30, R32, and R33. The final audio amplifier stage uses transistor TR8, which drives a push-pull output stage with transistor TR9 and a transformer T2. The output is connected to an earphone (L33) through a coupling capacitor C69. The circuit is powered by a 9V battery, with various resistors (R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R31, R34, R35) and capacitors (C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68) providing biasing and timing. A common ground line is shown at the bottom, and a 9V battery symbol is at the bottom right.

Components

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